Background

The emergence of antimicrobial resistance is a public health concern. Therefore, it is important that health care providers and antimicrobial stewardship teams become familiar with antimicrobial resistance norms in their facility's patient population as well as understand the significance of unusual trends or unexpected patterns. To do so they may rely on current antibiogram data and the ability of clinical laboratory scientists to recognize and report deviations from the expected. The Montana Public Health Laboratory (MTPHL) assists in this process by providing antimicrobial resistance confirmatory testing as well as publishing statewide antibiogram data. Clinical laboratories are encouraged to review intrinsic resistance tables in the CLSI document M-100, *Performance Standards for Antimicrobial Susceptibility Testing*[2] and compile their own facility's (yearly minimum) antibiogram data. MTPHL can use this data to assemble a statewide antibiogram using the methodology described by the Clinical and Laboratory Standards Institute (CLSI). [1] MTPHL has provided a statewide antibiogram since 2005 and for the 2015 analyses, AST data were collected from 17 laboratories and over 30,000 isolates of public health significance.

2015 Resistance Data

The MTPHL does not require Methicillin-Resistant *Staphylococcus aureus* (MRSA) or Vancomycin-Resistant *Enterococcus* species (VRE) be submitted for surveillance however, any questionable or atypical sensitivity patterns can still be confirmed. 2015 statewide antibiogram data shows that 2532 isolates were reported as Methicillin-Sensitive *Staphylococcus aureus* (MSSA); however, **four** of these isolates were also reported as Intermediate or Resistant to Vancomycin. **Careful caution should be taken when identifying and reporting suspected VISA/VRSAs as they are extremely rare; to date only fourteen VRSAs have been identified in the United States.**[5] Under the rules in the Laboratory Reporting of Communicable Diseases in Montana[4], all suspected or confirmed isolates of Carbapenem-Resistant *Enterobacteriaceae* organisms (*E. coli*, *K. pneumoniae*, *Enterobacter spp.*) **(CRE)** and Vancomycin Intermediate or Resistant *Staphylococcus aureus* (**VISA/VRSA)** are required to be submitted to MTPHL for confirmation and further characterization. Based on the 2015 state antibiogram data, **62** isolates reported in the *Enterobacteriaceae* family are potential CRE organisms. Of these, **58** suspected CRE isolates were submitted to MTPHL and **4** were positively confirmed.

References:

1) Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data; Approved Guideline-Third Edition. CLSI document M39-A3. Wayne, PA: Clinical and Laboratory Standards Institute; 2009.
2) Performance Standards for Antimicrobial Susceptibility Testing; Twenty Second Informational Supplement. CLSI document M100-S24. Wayne, PA: Clinical and Laboratory Standards Institute; 2015.
3) Antibiotic Resistance Threats in the United States, 2013. Atlanta, GA: Centers for Disease Control and Prevention; 2013.
4) Laboratory Reporting of Communicable Diseases in Montana (June 2013); http://www.dphhs.mt.gov/publichealth/lab/documents/LABDPHHSDiseaseReportingtoLHJ.pdf
5) Walters M, Lonsway D, Rasheed K, Albrecht, V, McAllister, S, Limbago B, Kallen A. Investigation and Control of Vancomycin-resistant *Staphylococcus aureus*: A Guide for Health Departments and Infection Control Personnel. Atlanta, GA 2015. Available at: *http://www.cdc.gov/hai/pdfs/VRSA-Investigation-Guide-05_12_2015.pdf*

MONTANA DPHHS
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Department of Public Health & Human Services

2015 ANTIBIOGRAM FOR SELECTED BACTERIA OF PUBLIC HEALTH AND CLINICAL SIGNIFICANCE: ISOLATES COLLECTED BY CLINICAL LABORATORIES IN MONTANA

		penicillins										cephems			macrolides				quinolones				
Gram Positive Isolates	**# of isolates (all sources)**	Penicillin	Ampicillin	Oxacillin	Trimethoprim-Sulfamethoxazole	Rifampin	Vancomycin	Tetracycline	Linezolid	Daptomycin	Meropenem	Cefotaxime	Ceftriaxone	Levofloxacin	Azithro, Clarithro, or Erythromycin	Clindamycin	Erythromycin	**# of isolates (urine only)**	Ciprofloxacin	Levofloxacin	Norfloxacin	Nitrofurantoin	Tetracycline
S. aureus (non-differentiated)	2456	17%		65%	98%	99%	100 %	97%	99%	99%					52%	83%	76%	184				94%	
S. aureus (MRSA)	1737			0%	94.%	97%	99%	91%	99%	99%					70%	59%	11%	92				98%	
S. aureus (MSSA)	2890	23%		100%	99%	99%	99%	96%	99%	99%					90.00%	69%	84.00%						
S. pneumoniae	288	88%			80%		100%	85%				91%	96%	98%			59%						
Enterococcus spp.	963	95%	90%				100%		100%	100%								622	71%	75%		76%	
E. faecalis	1770	98%	98%				99%		95%	99%								1572	66%	69%		93%	21%
E. faecium	175	17%	19%				43%		99%									70	18%	19%		5%	

		aminoglycosides			b-lactam/b-lactamase inhibitor				cephems						quinolones		carbapenems			sulfona-mide	penicillins			single agents				
Gram Negative Isolates	**# of isolates (all sources)**	Gentamicin	Tobramycin	Amikacin	Amoxicillin-Clavulanic Acid	Ampicillin-Sulbactam	Piperacillin-Tazobactam	Ticarcillin-Clavulanic Acid	Cefazolin	Cefuroxime	Cefepime	Cefotetan	Cefoxitin	Cefotaxime or Ceftriaxone	Ciprofloxacin	Levofloxacin	Ertapenem	Imipenem	Meropenem	Trimethoprim-Sulfamethoxazole	Piperacillin	Ampicillin	**# of isolates urine only**	Cephalothin	Norfloxacin	Nitrofurantoin	Sulfisoxazole	Trimethoprim
E. coli	15226	94%	94%	96%	88%	70%	97%	95%	92%	89%	96%	98%	96%	97%	79%	82%	99%	100%	91%	84%	58%	62%	9846	86%	82%	94%		85%
K. pneumoniae	2625	91%	89%	97%	83%	92%	84%	100%	86%	81%	90%	100%	86%	90%	88%	95%	100%	99%	100%	86%	47%	3%	754	56%	100%	43%		
Enterobactor spp.	1246	99%	99%	98%	1%		91%	95%	78%	48%	98%	75%		98%	96%	98%	87%	97%	98%	94%	77%	78%	515			24%		
Serratia spp.	178	100%	81%	100%							96%			100%		100%			100%	100%								
P. aeruginosa	1636	93%	98%	99%			97%				95%				80%	78%		92%	96%		100%							
Acinetobactor spp.	<30																											